American Heart Association 2025 updates

- **Presented by:**
- **Tony Carrozzino FP-C Guardian Air**

- **Derric Crandell FP-C Banner Air**

Financial Disclosure

- Neither Tony Carrozzino nor Derric Crandell have any relevant financial relationships with the American Heart Association.

Objectives:
Review of the 2025 American Heart Association's Updates for BLS, ACLS, and PALS

- Updates for Basic Life Support
- Updates for Advanced Cardiac Life Support
- Updates for Pediatric Advanced Life Support

2025 AHA BLS Updates

Age Identification

- Infant

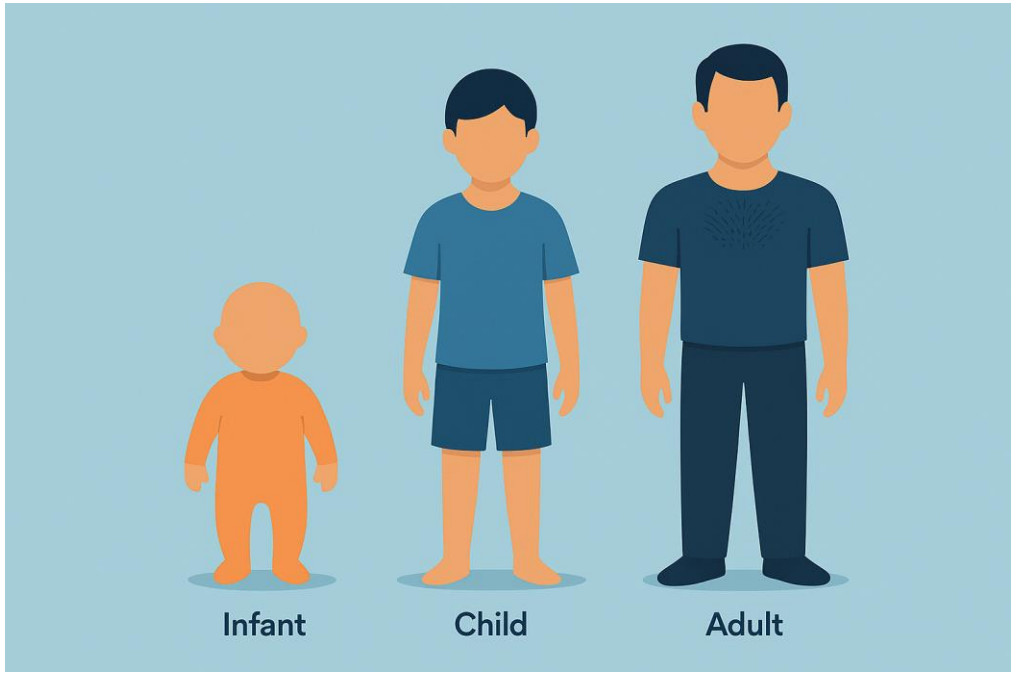
  Younger than 1 year (excluding the newly born).

- Children

  1 Year to Puberty.

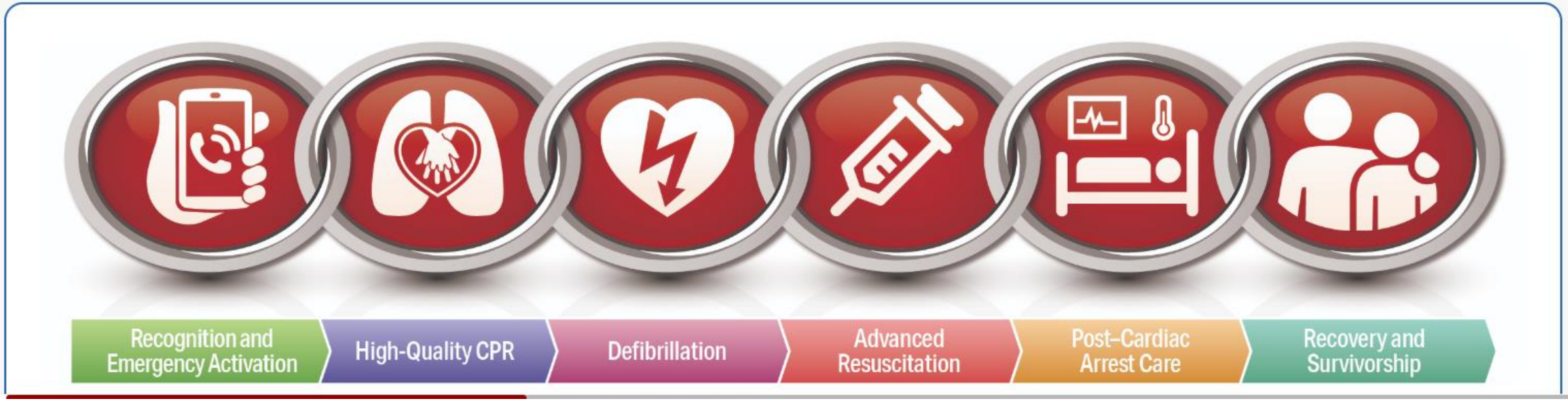
- Adult

  Signs of puberty and older.



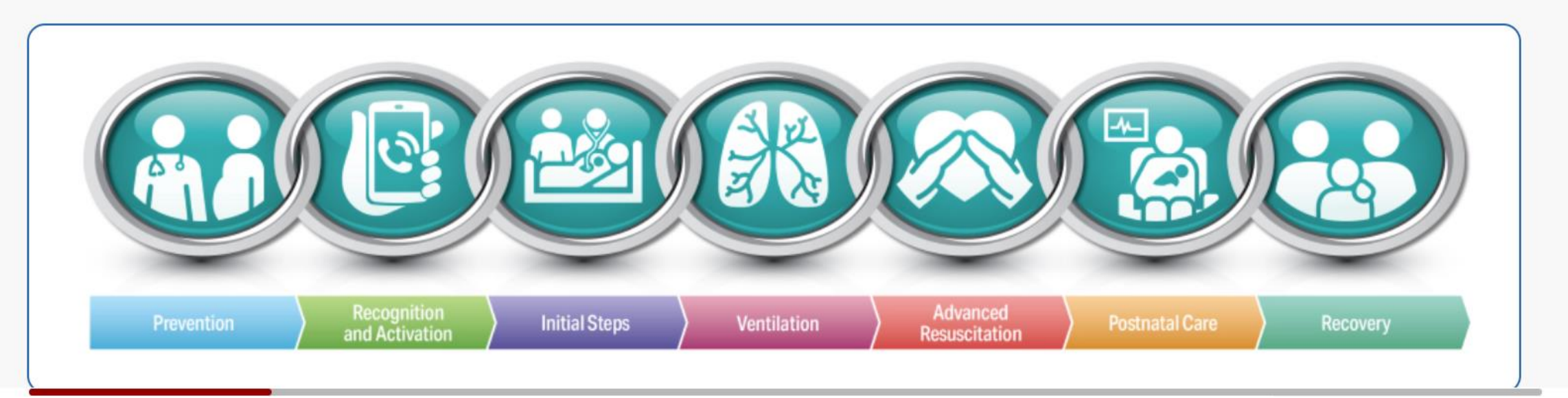
Chain of Survival

A single chain of survival applies to adults and pediatric in-hospital cardiac arrest and out-of-hospital cardiac arrest. In creating a singular chain, we acknowledge that before cardiac arrest, prevention and preparedness can avoid the need for and optimize resuscitation.



Newborn Chain of Care

There is a separate newborn chain of care that provides a framework for considering essential elements of the health care system related to neonatal health. A strong newborn chain of care has the potential to improve health in the neonatal period and long-term outcomes.

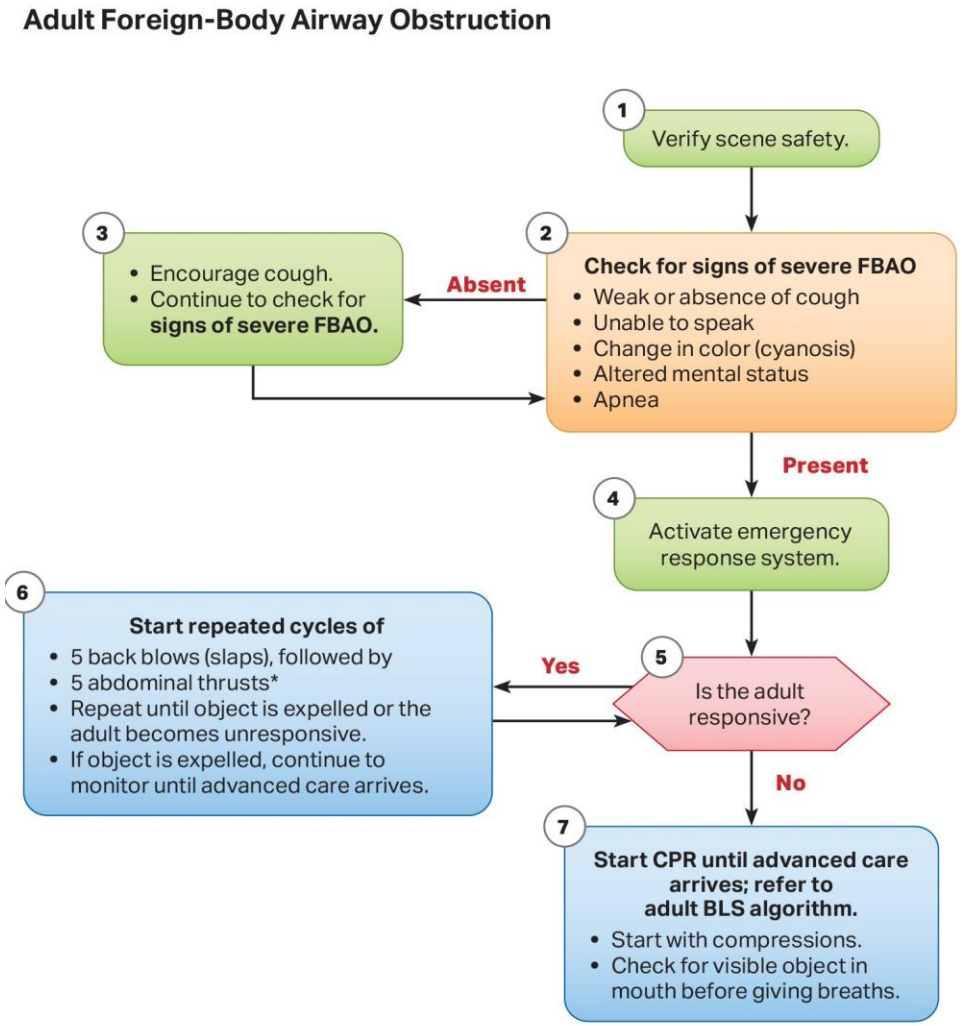


Cardiac Arrest in Women

- Cardiovascular disease is the No. 1 killer of women
- Emphasis on depiction of cardiac arrest in women
- Scenario incorporating the use of a female manikin

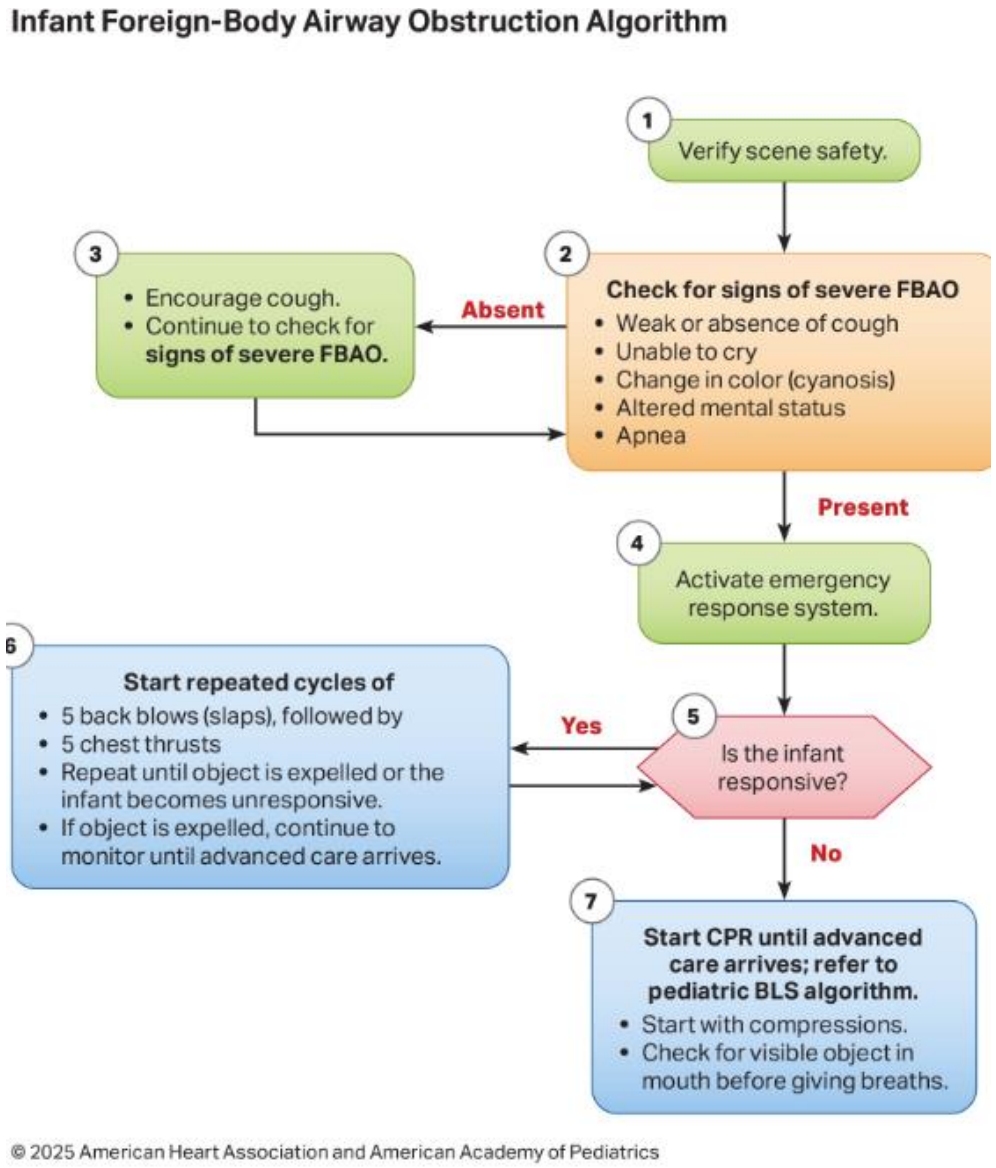
FBOA Adult/Children

- 5 back blows(slaps) fallowed by 5 ABD thrusts.
- Continue until object is expelled or patient becomes unresponsive.



Infant FBAO

- 5 back blows fallowed by chest thrusts (heal of the palm)
- Continue until object gets expelled or patient goes unconscious.



Seizure

When should EMS be called?

- First time seizure
- Last longer than 5 min
- More than one seizure at a time before patient returns to baseline
- Does not return to baseline within 5 to 10 min once seizure activity has stopped
- Pregnancy
- Trauma
- Occurs in water
- Less than 6 months
- Difficulty breathing

Pediatric Stroke

F.A.S.T or
Cincinnati Prehospital Stroke Scale are Recommended

Don’t forget glucose!

Common Signs and Symptoms of Stroke in Children

Focal signs and symptoms
• Hemiparesis • Limb weakness • Facial droop • Altered sensation • Visual disturbance • Speech disturbance
General signs and symptoms
• Altered mental status • Seizure • Headache • Ataxia • Vertigo/dizziness • Nausea/vomiting

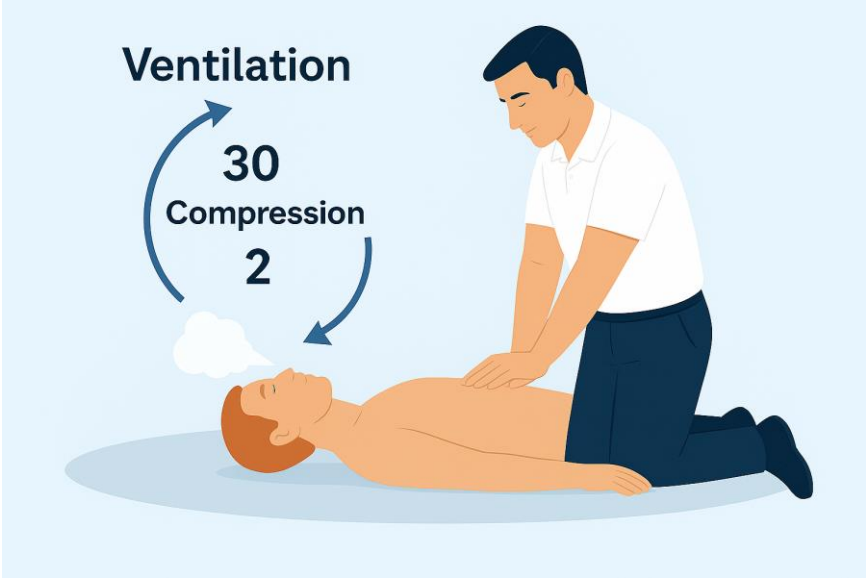
Ventilation

Ventilation

- Give enough volume to produce visible chest rise.
- Avoid hypoventilation (too few breaths or too little volume)
- Avoid hyperventilation (to many breaths and too large volume)

Compression to Ventilation ratio

- 30 compression to 2 breaths before placement of an advanced airway.



Compressions

Focus on the identification of a CPR coach for all cardiac arrests

Adult

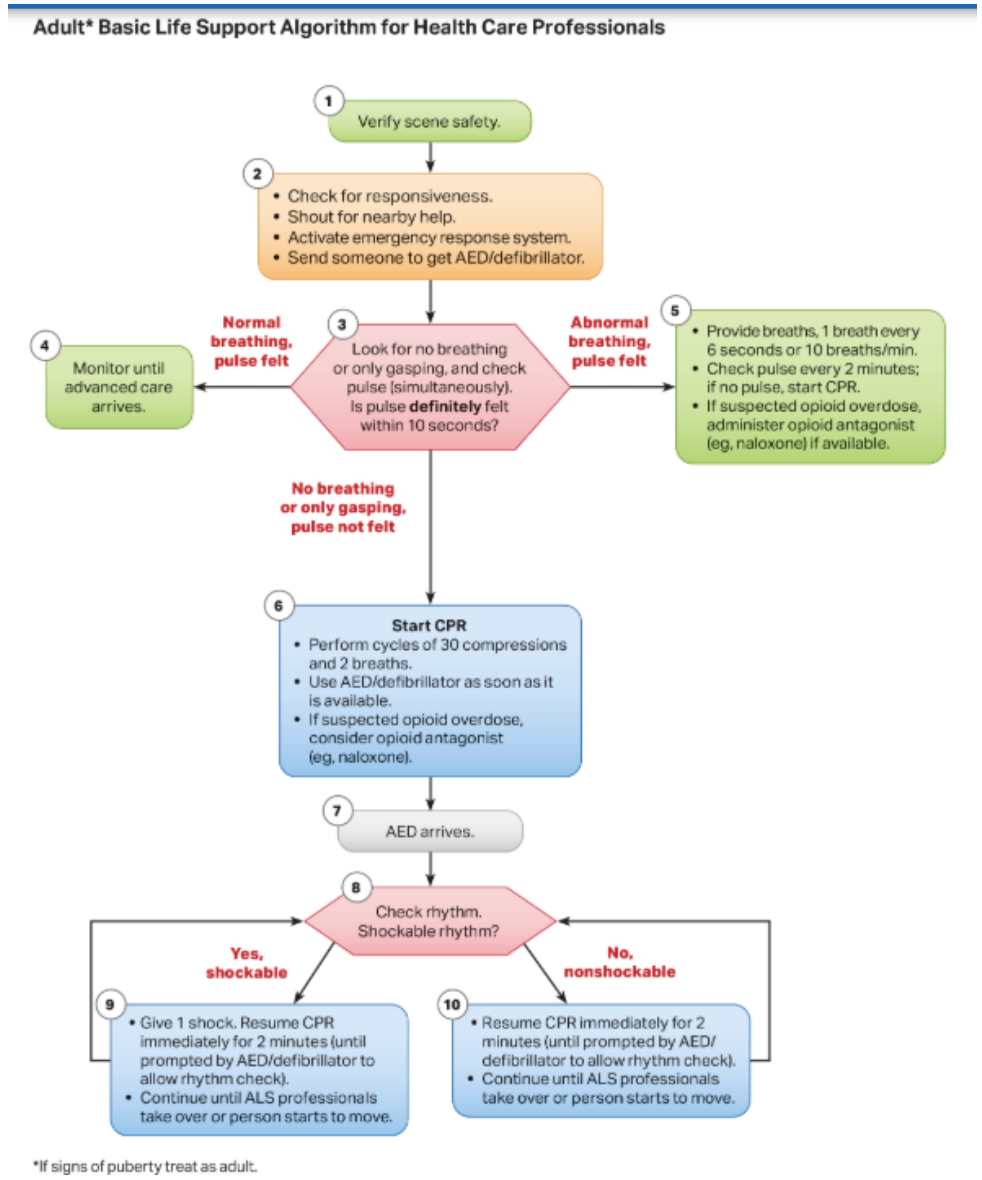
- Perform chest compressions with patient on firm surface.
- Patient's torso should be at the level of the rescuer's knees.

Infant

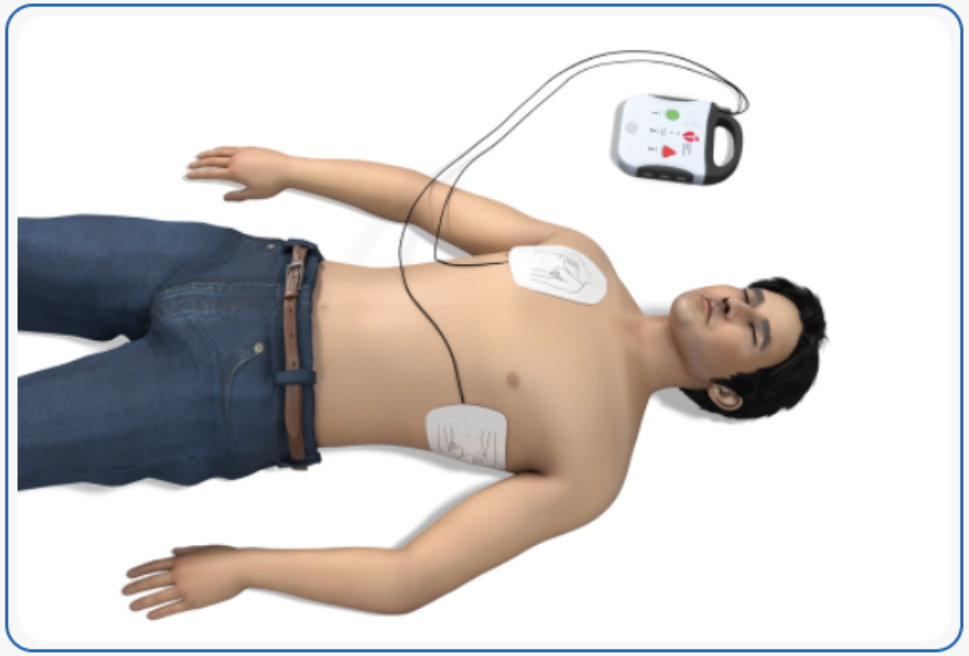
- Heel of hand
- 2 thumb encircling hand technique

Opioids

- Nacan no longer has its own algorithm and is now written into the BLS algorithm.
- Administration should not interfere with resuscitation efforts



AED Pad Placement



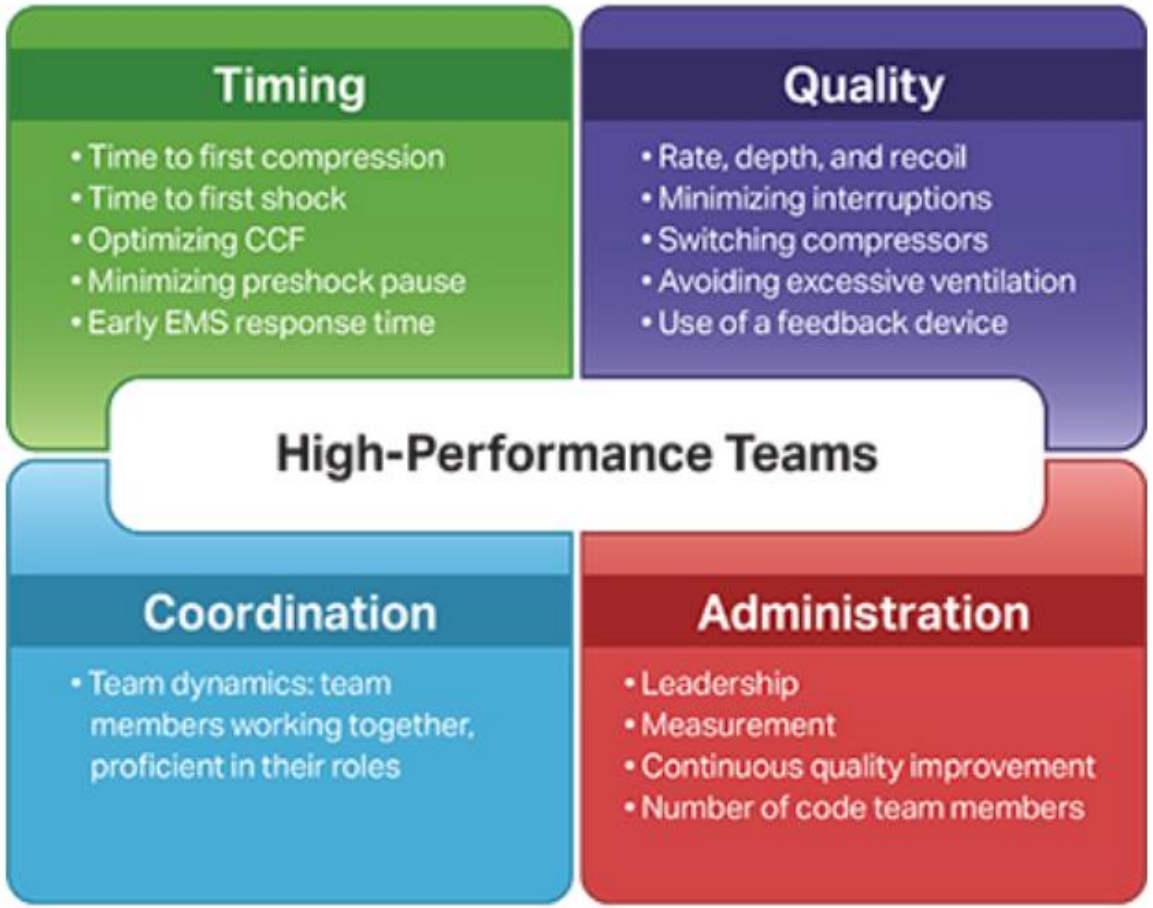
Anterolateral Placement

Place both pads on the person's bare chest. Place one pad vertically on the person's right upper chest. The top of the pad should be just under the clavicle. Place the second pad horizontally on the person's left lateral ribs. The middle of the pad should be below the axilla at the midaxillary line.

2025 AHA ACLS Updates

High-Performance Teams

Chest Compression Fraction (CCF) will need to be calculated for all AHA courses and require > 81% to pass



Positions for 6-Person High-Performing Teams

Resuscitation Triangle Roles

Compressor

- Assesses the patient
- Performs compressions according to local protocols
- Rotates every 2 minutes or earlier if fatigued

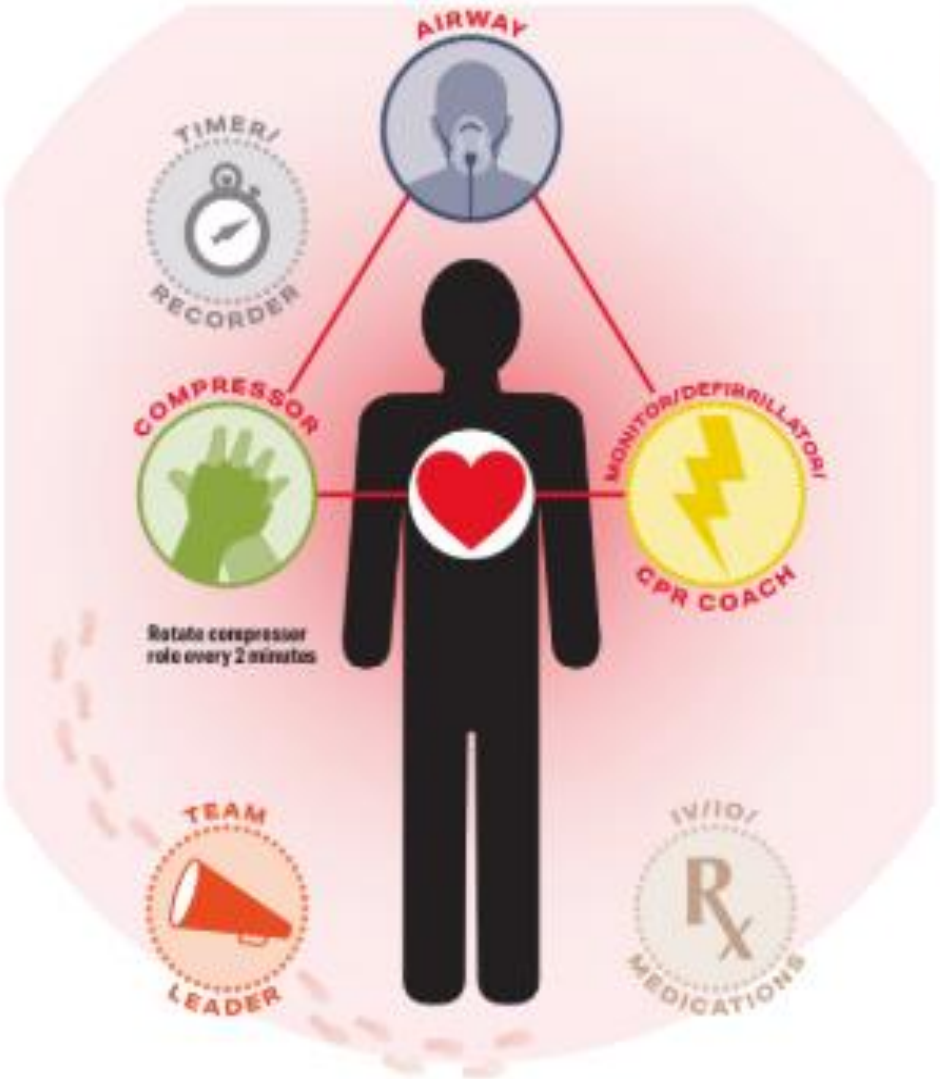
Monitor/Defibrillator/ CPR Coach

- Brings and operates the AED/monitor/defibrillator and acts as the CPR Coach if designated
- If a monitor is present, places it in position where it can be seen by the Team Leader (and most of the team)

Airway

- Opens the airway
- Provides bag-mask ventilation
- Inserts airway adjuncts as appropriate

The team owns the code. No team member leaves the triangle except to rotate compressors or to protect their safety.



Leadership Roles

Team Leader

- **Every resuscitation team must have a defined leader**
- Assigns roles to team members
- Makes treatment decisions
- Provides feedback to the rest of the team as needed
- Assumes responsibility for roles not defined

IV/IO/Medications

- An ALS professional role
- Initiates IV/IO access
- Administer medications

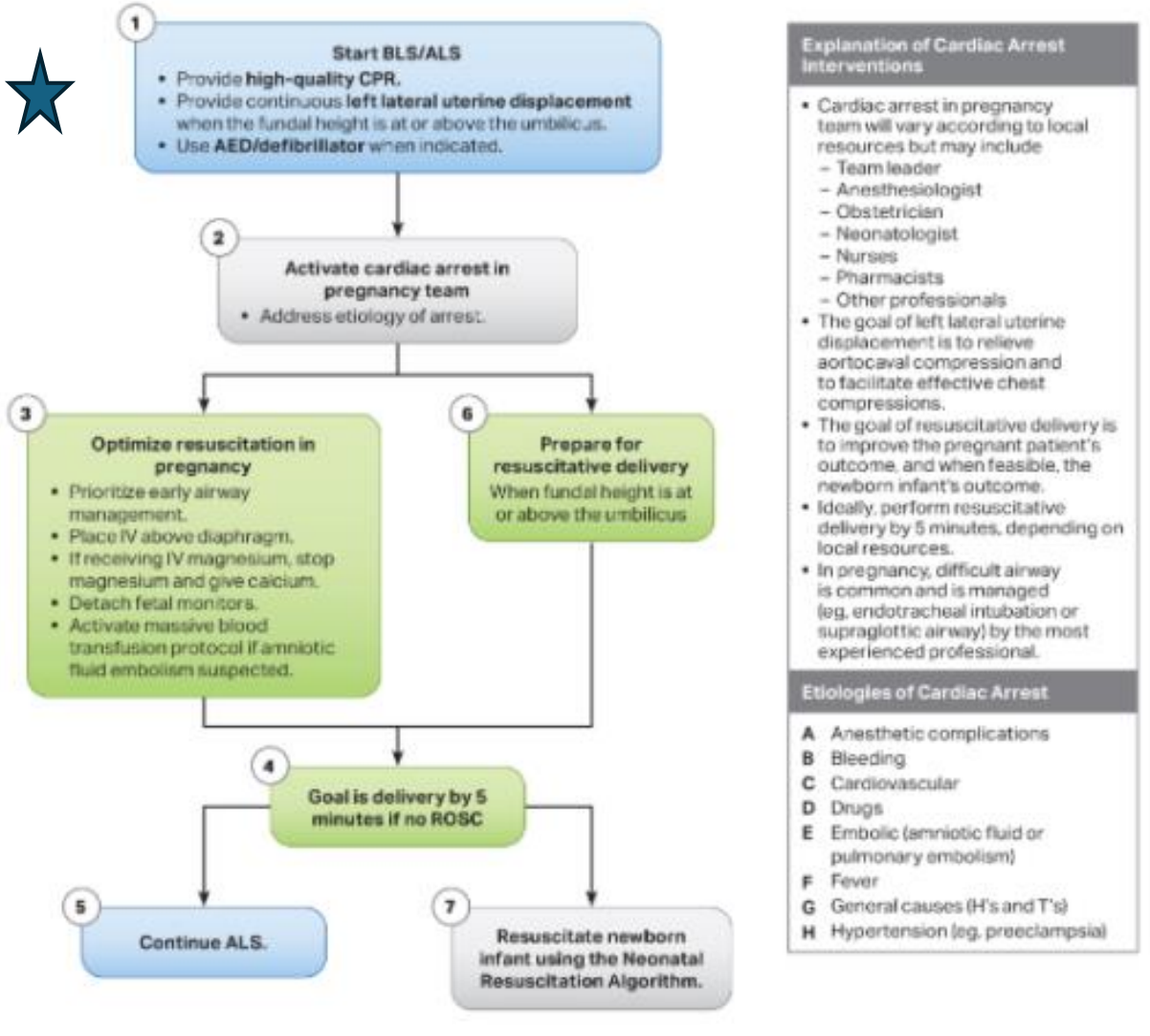
Timer/Recorder

- Records the time of interventions and medications (and announces when these are next due)
- Records the frequency and duration of interruptions in compressions
- Communicates these to the Team Leader (and the rest of the team)

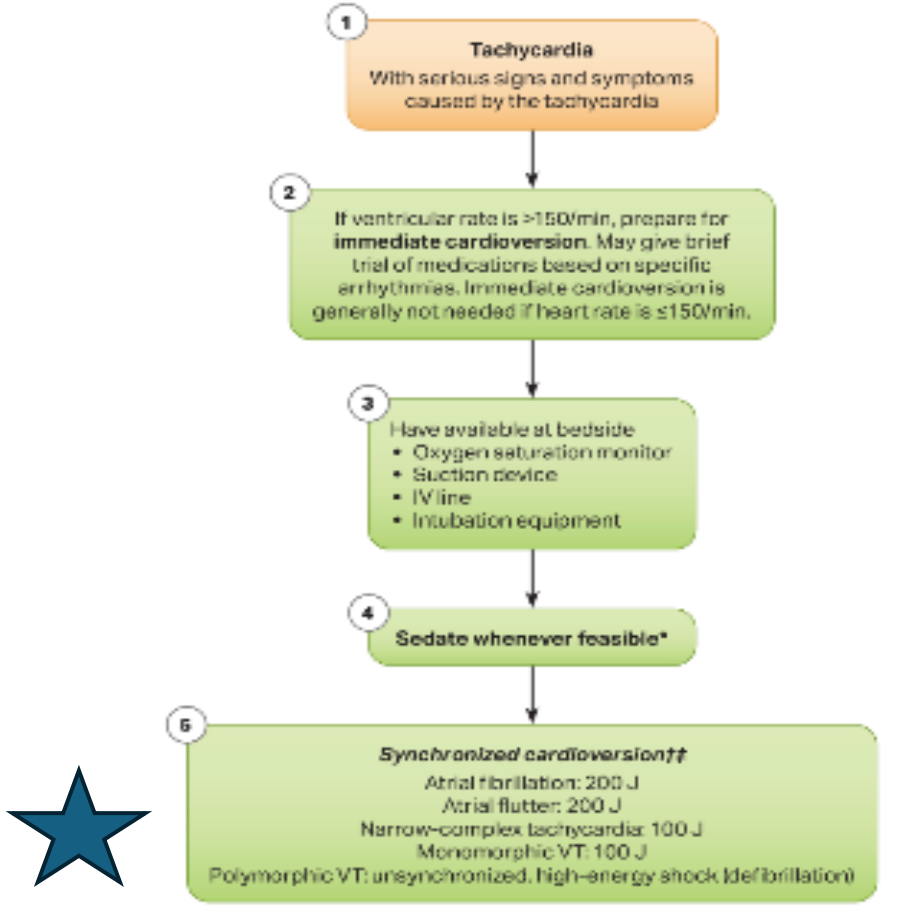
*This is a suggested team formation. Roles may be adapted to local protocol.

Cardiac Arrest During Pregnancy

Provide Continuous left lateral uterine displacement when the fundal height is at or above the umbilicus.



A-Fib/A-Flutter with Rapid Ventricular Response



Changes to the Tachycardia Algorithm

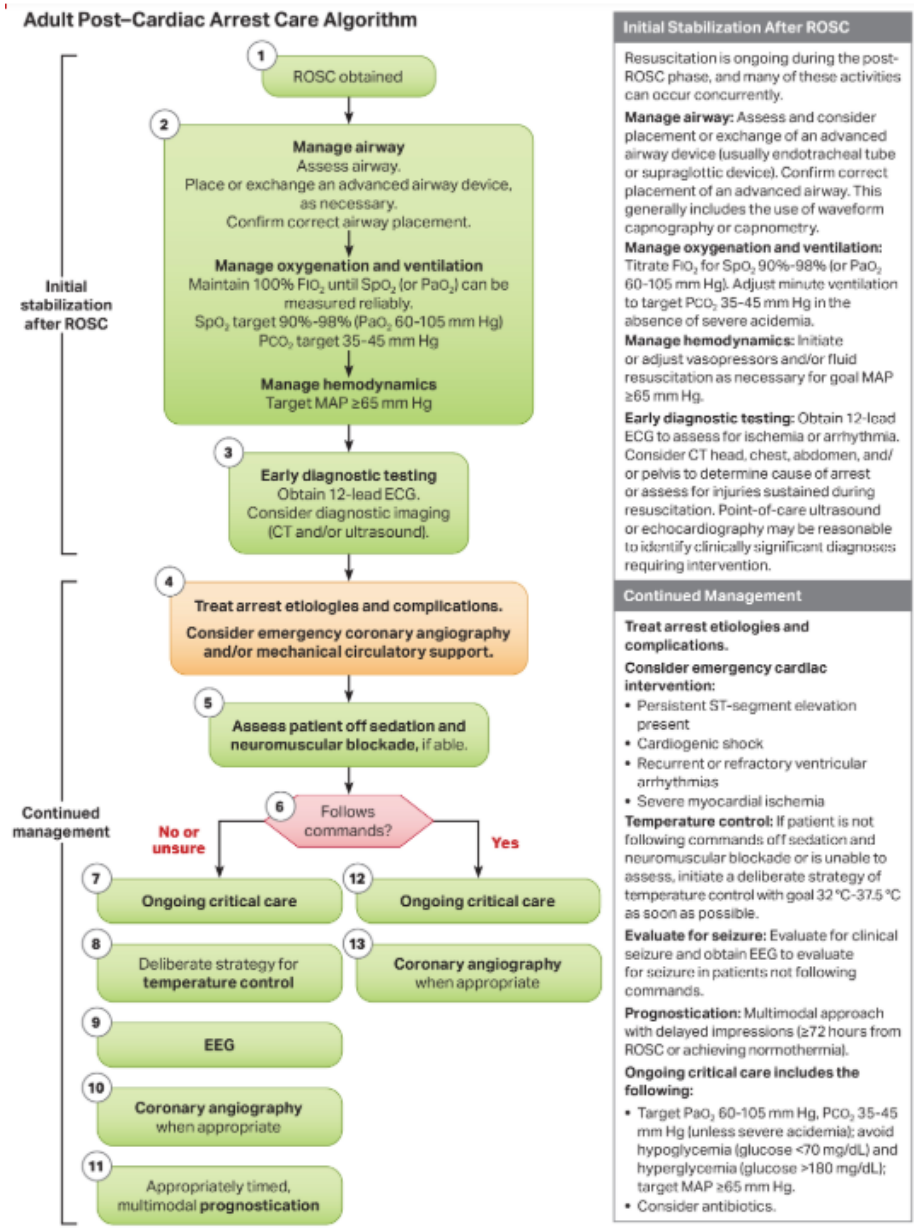
✔ Tachycardia

- Synchronized cardioversion initial recommended doses:
  - Narrow-complex tachycardia: 100 J
  - Monomorphic ventricular tachycardia: 100 J
  - Atrial fibrillation: 200 J
  - Atrial flutter: 200 J
  - Polymorphic ventricular tachycardia: defibrillation dose (not synchronized)
- Removed sotalol from the algorithm
- Changed supraventricular tachycardiac to narrow-complex tachycardia

ROSC

- Hypotension should be avoided in adults after ROSC by maintaining a minimum mean arterial pressure (MAP) of at least 65 mm Hg.

- Temperature control be maintained for at least 36 hours in adult patients who remain unresponsive to verbal commands after ROSC.

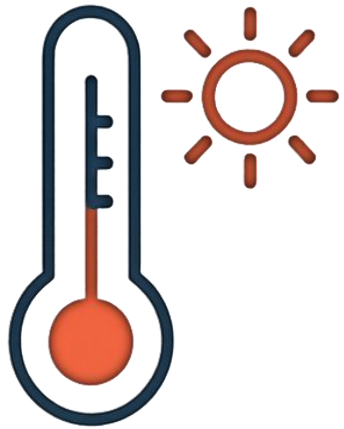


Life-Threatening Asthma Exacerbation

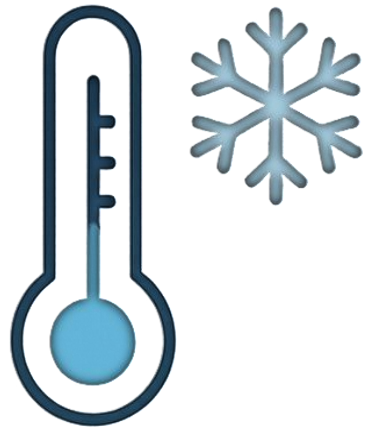
It may be reasonable to use extracorporeal life support (ECLS) for adults and children with life threatening asthma refractory to standard therapies.

Treatment with volatile anesthetics for adults and children with life threatening asthma refractory to standard therapies may be considered.

Environmental



Life-Threatening Hyperthermia



Life-Threatening Hypothermia

Environmental

Life threatening hypothermia

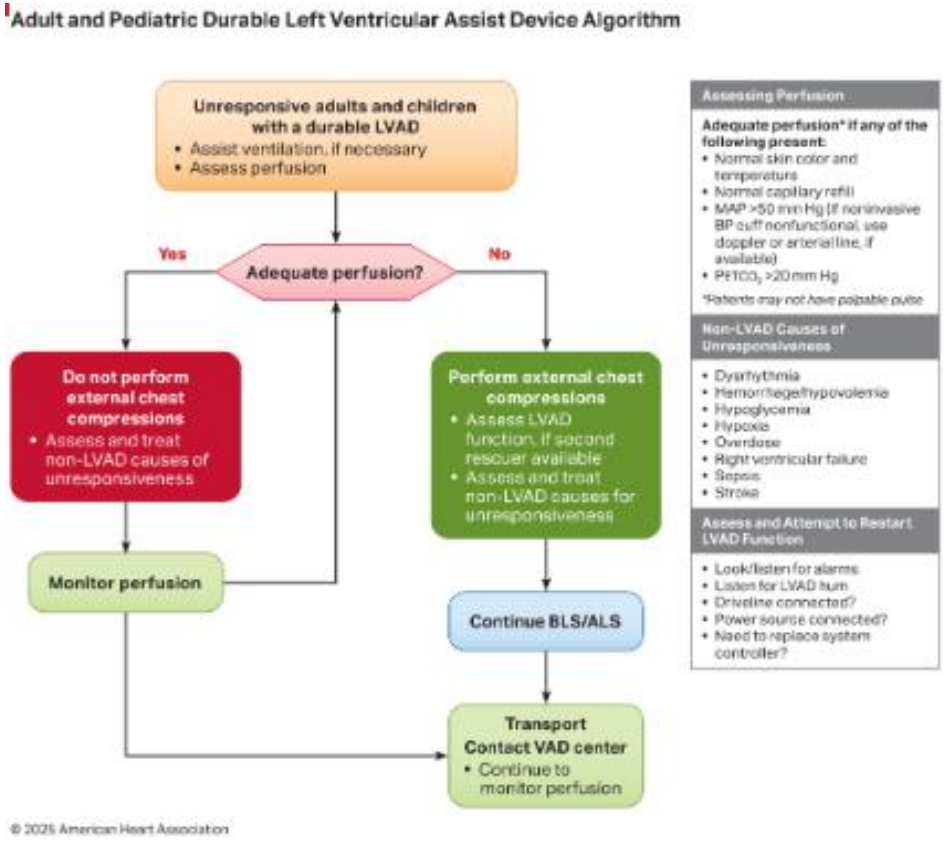
- Reasonable to use prognostication scores to guide the decision for initiation ECLS rewarming for adults and children in hypothermic cardiac arrest.
- Reasonable to rewarm adults and children with environmental hypothermia and not in cardiac arrest using ECLS.

Life threatening hyperthermia

- Reasonable to choose immersion in ice water over other cooling methods in adults and children with life threatening hyperthermia.
- Reasonable to cool adults and children with life threatening hyperthermia as rapidly as possible with a decrease of at least 0.015 degrees C/min.

Left Ventricular Assist Devices

- In unresponsive adults and children with durable left ventricular assist devices and impaired perfusion, chest compressions should be performed.
- Chest compressions should be performed while simultaneously assessing device-related reversible causes.



2025 AHA PALS Updates

Science Updates

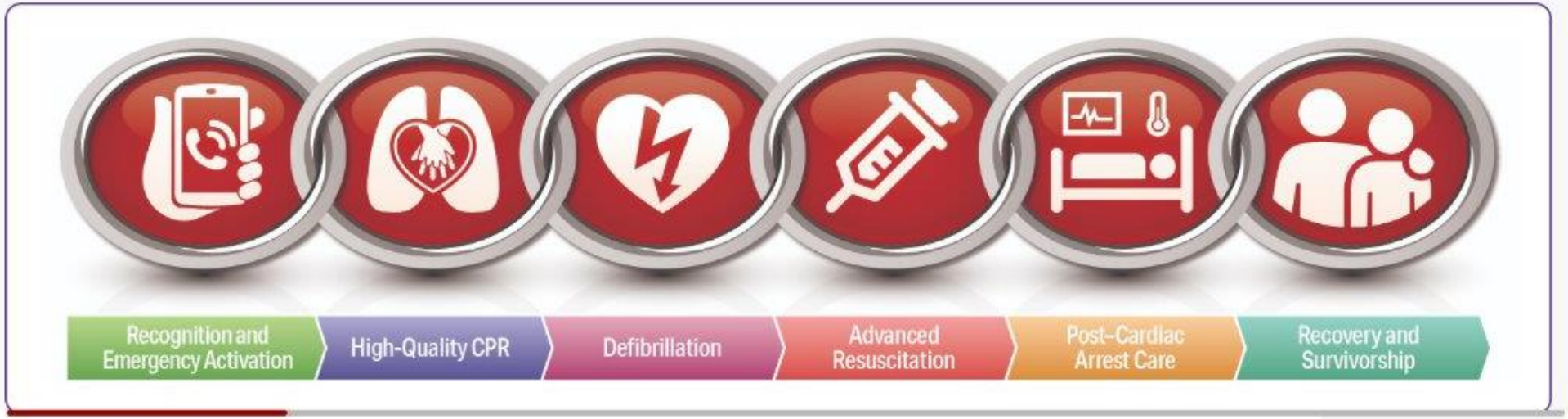
Chain of Survival

The systems of care guidelines follow the unified cardiac arrest Chain of Survival, beginning with prevention and preparedness to resuscitate, and then proceeding with early identification of cardiac arrest, followed by effective resuscitation through to post–cardiac arrest care, survivorship, and recovery.

A single Chain of Survival is intended to apply to adult and pediatric in-hospital cardiac arrest and out-of-hospital cardiac arrest. In creating this singular chain, it is acknowledged that before cardiac arrest, prevention and preparedness can both avoid the need for and optimize resuscitation.

The links in the updated Chain of Survival are recognition and emergency activation, high-quality CPR, defibrillation, advanced resuscitation, post–cardiac arrest care, and recovery and survivorship.

Scroll down to view the image.



Science Updates

Sequence of Resuscitation

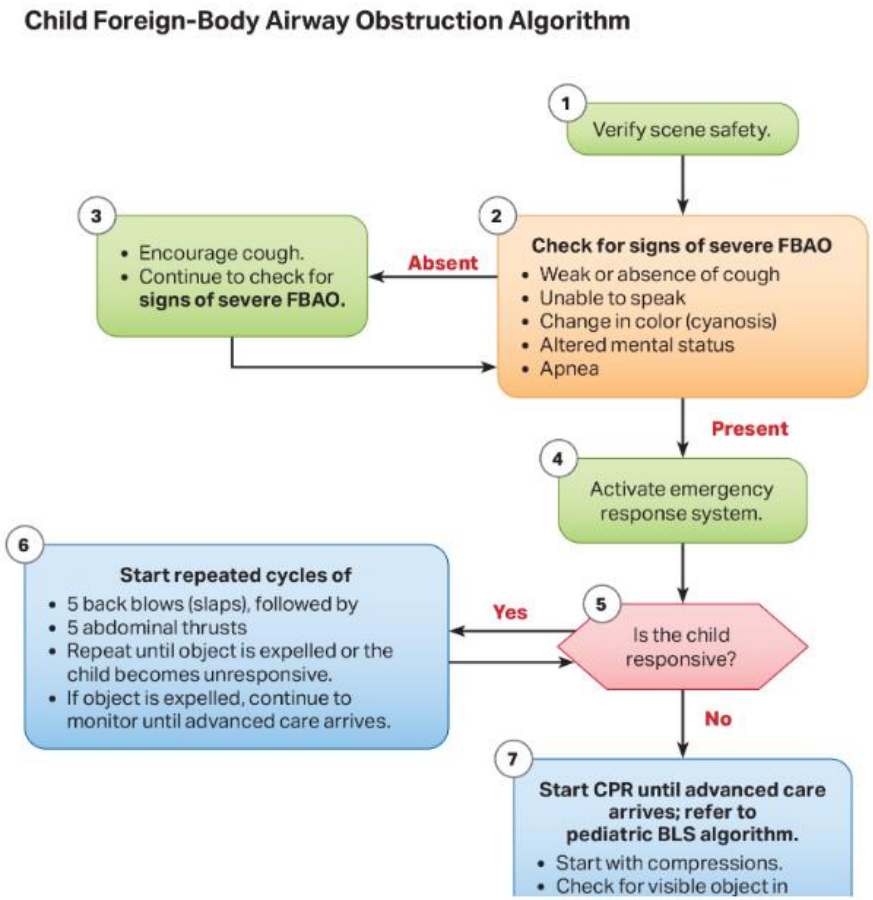
2025 (Updated): For infants, rescuers should compress the sternum with the heel of 1 hand or use the 2 thumb–encircling hands technique. If the rescuer cannot physically encircle the chest, it is recommended to compress the chest with the heel of 1 hand.

Why: Systematic reviews and meta-analyses from simulation studies suggest that the 2 thumb–encircling hands technique is the superior technique for giving compressions to infants when compared with the 2-finger technique, particularly for achieving adequate depth.

In a multicenter prospective observational registry study, the single-hand technique resulted in greater compression depth than the 2 thumb–encircling hands technique with infants, with no difference in chest compression rate between hand positions. The 2-finger technique was used rarely in this study, but when used, no chest compression segments were compliant with AHA guidelines.

Given this, the heel-of-1-hand or 2 thumb–encircling hands technique is recommended for infants. The long-used 2-finger technique for infant CPR is no longer recommended.

Science Updates

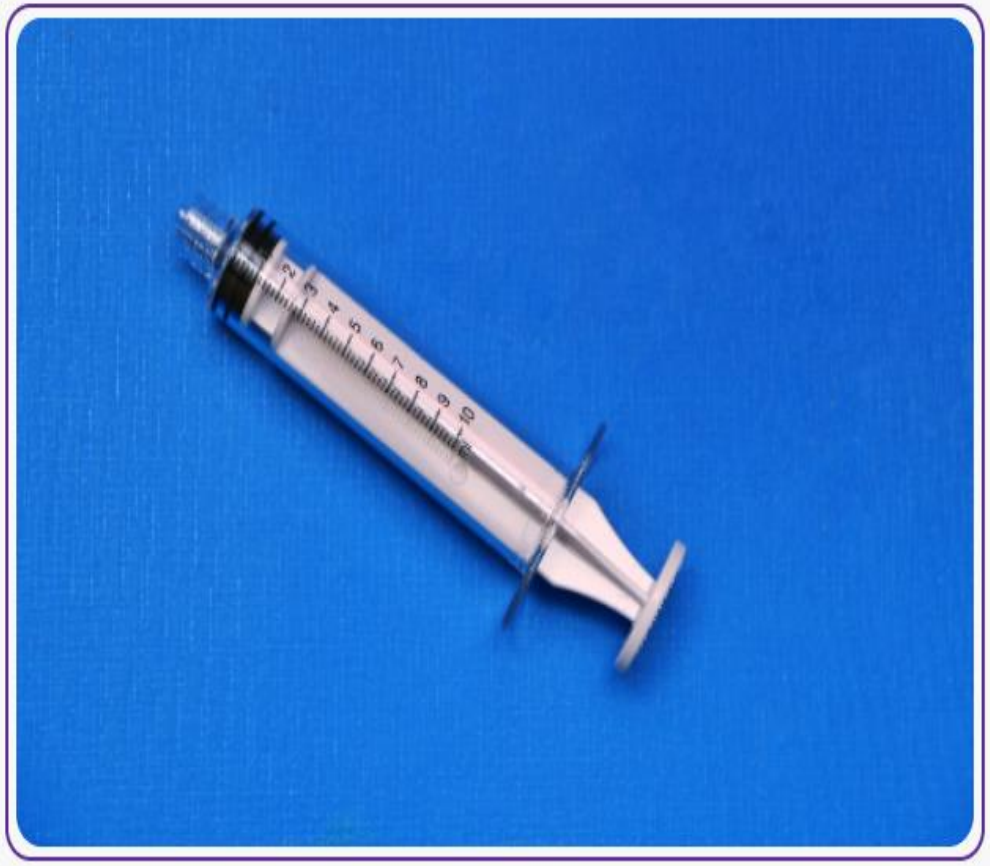


2025 (Updated): For children with severe foreign-body airway obstruction (FBAO), repeated cycles of 5 back blows alternating with 5 abdominal thrusts should be performed until the object is expelled or the child becomes unresponsive (see the new FBAO algorithm). Rescuers should activate the emergency response system.

Why: Many FBAOs are relieved by allowing the patient to cough or, if severe, by lay rescuers using chest or abdominal thrusts. A recent observational study of adult and pediatric FBAOs suggests improved clearance of a foreign body with the use of back blows over abdominal thrusts. To create consistency for instructional purposes, and in the absence of inferiority from pediatric data, management of severe FBAO in children now starts with a series of back blows instead of abdominal thrusts. Repeated cycles of 5 back blows followed by 5 abdominal thrusts are performed until the obstruction is cleared or the child becomes unresponsive.

Science Updates

Drug Administration During Cardiac Arrest



2025 (Updated): For infants and children in cardiac arrest with initial nonshockable rhythm, it is reasonable to administer the initial dose of epinephrine as early as possible.

Why: A recent systematic review of 7 observational studies identified that shorter time to administration of epinephrine in out-of-hospital cardiac arrest and in-hospital cardiac arrest was associated with increased rates of favorable outcome. A time to first dose of epinephrine of less than 3 minutes was associated with highest rates of favorable outcome, although there was no direct comparison across time to first epinephrine dose intervals (eg, <5 min, <10 min).

Science Updates

Measuring Physiology During CPR

2025 (Updated): For infants and children with invasive airways in place during CPR, end-tidal carbon dioxide ($ETCO_2$) monitoring may be considered to monitor CPR quality.

2025 (New): A specific $ETCO_2$ cutoff value alone should not be used as an indication to end resuscitative efforts in infants and children.

Why: Monitoring exhaled carbon dioxide levels among patients receiving CPR with an invasive airway is important because $ETCO_2$ reflects native cardiac output and ventilation efficacy as well as feedback on CPR quality.

In a recent prospective multicenter study that evaluated average $ETCO_2$ during the first 10 minutes of in-hospital CPR in children, $ETCO_2$ values of 20 mm Hg or greater during CPR were associated with increased odds of return of spontaneous circulation and survival to discharge as well as higher intra-arrest blood pressures.

There was no association with CPR quality metrics, such as chest compression rate and depth. However, when rescuers are considering termination of resuscitative efforts, it is vital that they avoid using a specific $ETCO_2$ cutoff value alone because survival has been noted in patients with average $ETCO_2$ less than 20 mm Hg.

2025 (New): For infants and children with continuous invasive arterial blood pressure monitoring in place during CPR, it may be reasonable for health care professionals to target a diastolic blood pressure of 25 mm Hg or greater in infants and 30 mm Hg or greater in children 1 year of age or older.

Why: A new study shows that among pediatric patients receiving CPR with an invasive arterial line in place, rates of survival with favorable neurologic outcome were improved if the diastolic blood pressure was at least 25 mm Hg in infants and at least 30 mm Hg in children.

Science Updates

Post–Cardiac Arrest Management

2025 (Updated): After cardiac arrest in infants and children, it is recommended to maintain systolic and mean arterial blood pressure greater than the 10th percentile for age.

Why: Because blood pressure is often labile in the post–cardiac arrest period, recognition of hypotension (less than fifth percentile for age and sex) is important. Hypotension is common following return of circulation from cardiac arrest, occurring in 25% to 50% of infants and children.

Two observational studies associated systolic blood pressure below the fifth percentile for age in the first 12 hours following cardiac arrest with decreased rates of survival to discharge.

In addition, a secondary analysis of the Intensive Care Unit-Resuscitation trial of pediatric in-hospital cardiac arrest found higher rates of survival to hospital discharge as well as survival to hospital discharge with favorable neurologic outcome when blood pressure targets were above a threshold of systolic blood pressure greater than 10th percentile for age and diastolic blood pressure greater than 50th percentile for age during the first 6 hours post–cardiac arrest.

Science Updates

Post–Cardiac Arrest Recovery and Survivorship

2025 (Updated): It is reasonable that infants and children who survive cardiac arrest be evaluated for physical, cognitive, and emotional needs to guide follow-up care within the first year following cardiac arrest.

Why: There is growing recognition that recovery from cardiac arrest continues long after initial hospitalization. Survivors may require ongoing integrated medical, rehabilitative, caregiver, and community support in the months to years after their cardiac arrest. A recent AHA scientific statement highlights the importance of supporting patients and families during this time to achieve the best possible long-term outcome.

Education Updates

Use of Feedback Devices During CPR Training

2025 (Updated): Feedback devices are recommended for use during CPR training for health care professionals.

2025 (Updated): Feedback devices are recommended for use during CPR training for lay rescuers.

Why: A meta-analysis of several new randomized controlled trials conducted with health care professionals demonstrated that CPR feedback devices had a moderate to large effect on all CPR quality metrics. Three randomized controlled trials conducted with lay rescuers demonstrated that feedback devices were effective in increasing mean CPR quality metrics.

Education Updates

Teamwork and Leadership Training

2025 (Updated): It is recommended that life support training for health care professionals includes a specific emphasis on teamwork competencies.

Why: Of the 14 randomized controlled trials reviewed, 12 reported superior performance after specific teamwork training in outcomes related to communication, leadership behavior, nontechnical skills, workload management, and overall teamwork at course completion.

Education Updates

Scripted Debriefing

2025 (New): It may be reasonable for an instructor to use a debriefing script during resuscitation education.

Why: Scripted debriefing involves the creation of a written plan for debriefing students during or after life support training. Standardized debriefing helps to maintain consistency in the delivery of debriefings across training centers and resuscitation programs. Six studies with varying outcomes were identified.

Education Updates

Use of Cognitive Aids

2025 (New): It may be reasonable for health care professionals to use cognitive aids during resuscitation.

2025 (New): It is not recommended for lay rescuers to use cognitive aids during resuscitation.

Why: Cognitive aids are resources that provide prompts aimed at encouraging recall of information and increasing the likelihood of correct performance and behaviors. Published simulation data suggest that cognitive aid use by health care professionals may improve resuscitation performance. For lay rescuers, cognitive aid use was associated with significant delays in starting CPR, leading to a recommendation against their use for lay rescuers.

Questions?